# Getting Space-Based ISR Data to Warfighters

William Messer

AS THE ARMY transforms itself into the Objective Force, the need for and importance of timely and accurate intelligence will increase exponentially. Dispersed, highly mobile forces equipped with the latest weapons will require an intelligence system that is flexible, robust, and reliable. Automated processes must supplement or replace many of the traditional "human-in-the-loop" activities to manage the vast amount of intelligence data available to warfighters. Intelligence, surveillance, and reconnaissance (ISR) sensors will quickly pass intelligence to commanders who are engaged with the enemy throughout the length and breadth of the battlefield.

Regardless of the data source, Army Tactical Exploitation of National Capabilities Program (TENCAP) systems will play a vital role in any future U.S. conflict. Sensors will include the familiar signals intelligence (SIGINT) and imagery intelligence (IMINT) systems, and an added category called measurement and signature intelligence (MASINT). MASINT sensors may operate beyond the spectrum of traditional SIGINT and IMINT sensors and use special processing and data-combining techniques to provide intelligence information. The U.S. Army Space and Missile Defense Command's Army Space Program Office (ASPO) is providing leading-edge, tactical ground stations that bring this critical intelligence data to warfighters at the forefront of any conflict.

ASPO was established in 1973 to integrate the TENCAP, to serve as a unique technical and fiscal interface with the national program offices, and to manage the TENCAP materiel acquisition process. TENCAP is charged with exploiting the current and future tactical potential of national capabilities and integrating these capabilities as rapidly as possible into the Army's tactical decisionmaking process.

National systems are designed to support strategic requirements. ASPO leverages national technology to take information from these strategic systems and provide it to tactical levels. During planning and execution, this data gives tactical units an accurate and current picture of both the enemy and the terrain. Combining national data with data from other sources significantly enhances intelligence preparation of the battlefield (IPB) and demonstrates the ability to support maneuver and target development, especially for deep operations. For example, in Haiti, TENCAP systems provided the primary source of imagery directly to the joint task force (JTF) commander's analysts, enabling them to plan the operation and execute the initial assault. During Operation Desert Storm, TENCAP systems provided support for targeting deep operations and imagery for IPB for both XVIII and VII Corps. Army soldiers controlled the U-2 sensors, processed the imagery, and via a tennis shoe interface, provided vital data to Air Force analysts for future targeting.

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TENCAP systems also provide significant support to humanitarian efforts. After Hurricane Andrew, TENCAP systems provided the relief effort's task force commander with a rapid and detailed damage assessment. TENCAP's secondary dissemination and intelligence broadcast capabilities also foster continuing awareness through all phases of operations, enabling the tactical commander to see, hear, and target deep on today's battlefield and then to assess the effects of shooting deep.

The most recent system in the TENCAP inventory is the tactical exploitation system (TES), which is currently being fielded across the Army. It is replacing earlier systems now designated as legacy systems at division, corps, and higher echelons. TES is incorporated into the U.S. Navy's Littoral Surveillance System, and the Air Force is acquiring certain TES functions to support dynamic battle management at air operations centers. TES garnered high-level joint interest during the Navy's Joint Fleet Battle Experiment–Echo at Camp Pendelton, California, in March 1999 and during the Air Force's Joint Expeditionary Force Experiment 99 at Nellis Air Force Base, Nevada, from August to September 1999. During both experiments, TES successfully demonstrated joint interoperability and promoted innovative concept development among Army, Navy, and Air Force ISR systems. TES was also used during the Navy's Joint Fleet Battle Experiment–India in June 2001 to demonstrate joint support to the Naval Fires Network concept.

Army TENCAP systems are an integral part of the G2's taskable assets. Typically, TENCAP assets are physically located at the corps tactical operations center and are assigned to the corps military intelligence brigade. Intelligence collection requirements are generated at the corps G2. The G2 collection manager plans for and tasks TENCAP assets in accordance with established processes.

## Military Intelligence Organization and TPED

ISR activities involve the tasking, processing, exploitation, and dissemination (TPED) process. Army TENCAP systems at corps and above are used in each step of the process. The system architecture provides for receiving, processing, exploiting, storing, and disseminating combat intelligence from national and selected theater collectors. The equipment consists of various intelligence and electronic warfare communications and processing components that are integrated to provide theater commanders and tactical units with timely targeting, battle planning, and battle damage assessment information.

TENCAP systems can task national and theater ISR assets with varying levels of interaction and sensor control. The equipment can generate requests for national imagery products and then transmit it through the chain of command to the collection manager. With respect to the imagery sensors onboard the U-2, the TES has level 4 control, which means both the flight plan and sensor target deck can be modified in near real time. This capability is used to perform a detailed examination of an area to resolve potential target identification.

In addition to tasking collection assets, TENCAP systems also receive preprocessed ISR data from several national and theater sensors. The benefit of preprocessed data is that it can be processed to respond to the commander's intelligence information needs. Data types that can be processed into the corps' TENCAP systems include national imagery and signal external information. Intelligence reports from national and theater sensors can also be parsed into the appropriate databases.

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Software tools on the computers and workstations in TENCAP vans facilitate exploiting the ISR data. Imagery files are processed by electronic light table (ELT) software and displayed for the imagery analysts. The analysts use ELT and other exploitation tools available at their workstations to conduct first-phase exploitation, to annotate the images, and to produce secondary imagery dissemination (SID) products.

Intelligence products from the TENCAP system are disseminated primarily through the All-Source Analysis System (ASAS) at the same echelon. The information can be transmitted using terrestrial links such as the Secret Internet Protocol Router Network (SIPRNET), Joint Worldwide Intelligence Communications System (JWICS), Automatic Digital Network (AUTODIN), Data Management System (DMS), point-to-point, tactical area communications, and dial-up.

TENCAP units can communicate with other TENCAP units at the same level or across echelons to support their operations; they have ultrahigh frequency (UHF) line-of-sight and UHF satellite communications (SATCOM) capability for this purpose. Annotated imagery of a target area, SID products,

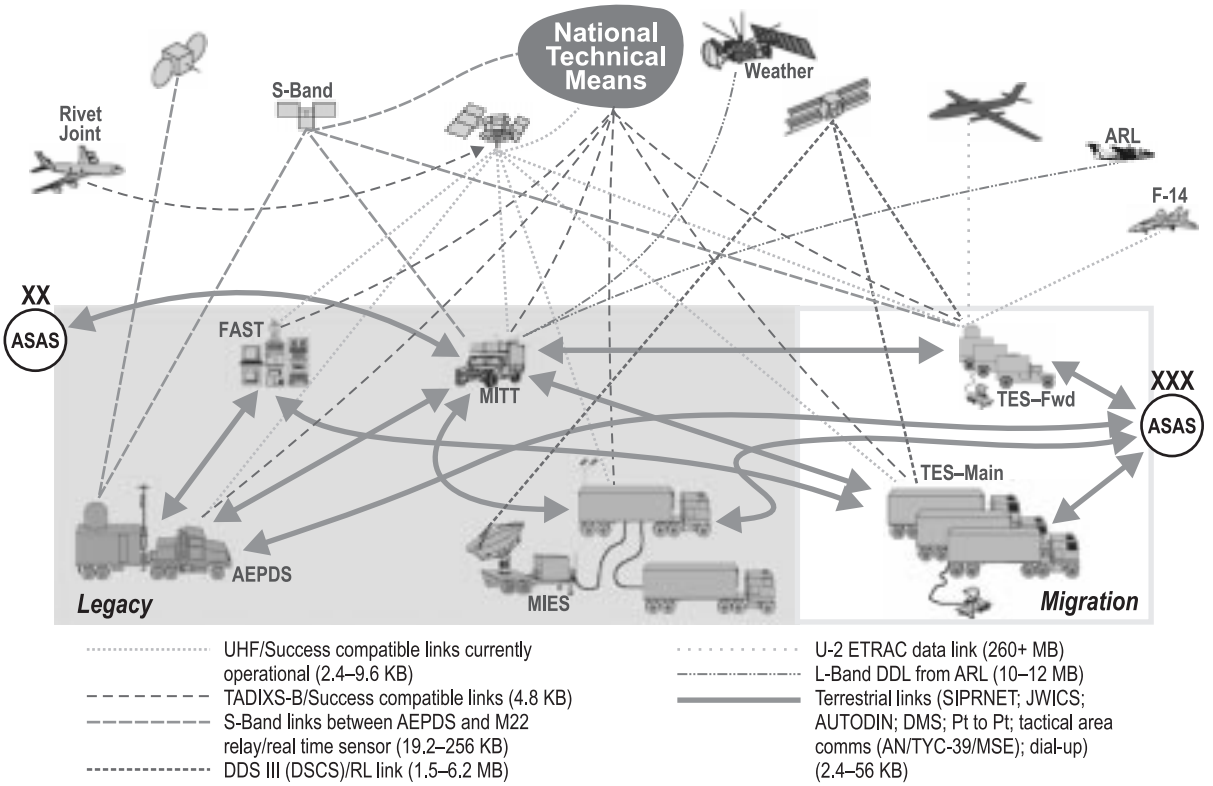


Figure 1. TENCAP Architecture

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and electronic order of battle files are often sent from the corps to the division for required retransmission to the division ASAS and for intelligence professionals to use. TENCAP personnel can post the intelligence analysis results to JWICS or SIPRNET. The analysis can include both IMINT and SIGINT information associated with an area of interest.

Finally, the opportunity to pass time-critical information via landline still remains. On several exercises in recent years, vital information that was needed by units was provided by telephone directly from the TENCAP system officer in charge to the respective S2 or G2 of the unit in contact.

## Current TENCAP Systems

The TES is designed for split-based operations. A TES is composed of two operational nodes: TES-forward and TES-main. Each node has identical functional capabilities but with different packaging. The two have different numbers of workstations, different mobility capabilities, and different antennas.

The TES-forward operates a modular interoperable surface terminal (MIST). The TES-forward is equipped with six high-mobility, multipurpose wheeled vehicles, one of which carries the MIST, and an M1085 cargo truck for towing the MIST antenna. TES-forward can be transported on six C-130s or three C-141s and can be driven on and off the aircraft.

The TES-main operates a triband satellite communications subsystem (TSS). The TES-main is equipped with a main tactical mission vehicle, a main communications vehicle, a TSS vehicle, a main tactical support vehicle, and a main generator vehicle. It uses the TSS antenna mounted on a 5-ton truck. TES-main is housed in air-transportable, 40-foot vans. The TES-main can be transported on four C-141s, three C-17s, or one C-5 and can be driven on and off the aircraft.

The mobile integrated tactical terminal (MITT) is a small, compact, highly mobile, self-sufficient system that provides the division commander with TENCAP capabilities. The MITT receives, processes, and disseminates multidisciplined informa-

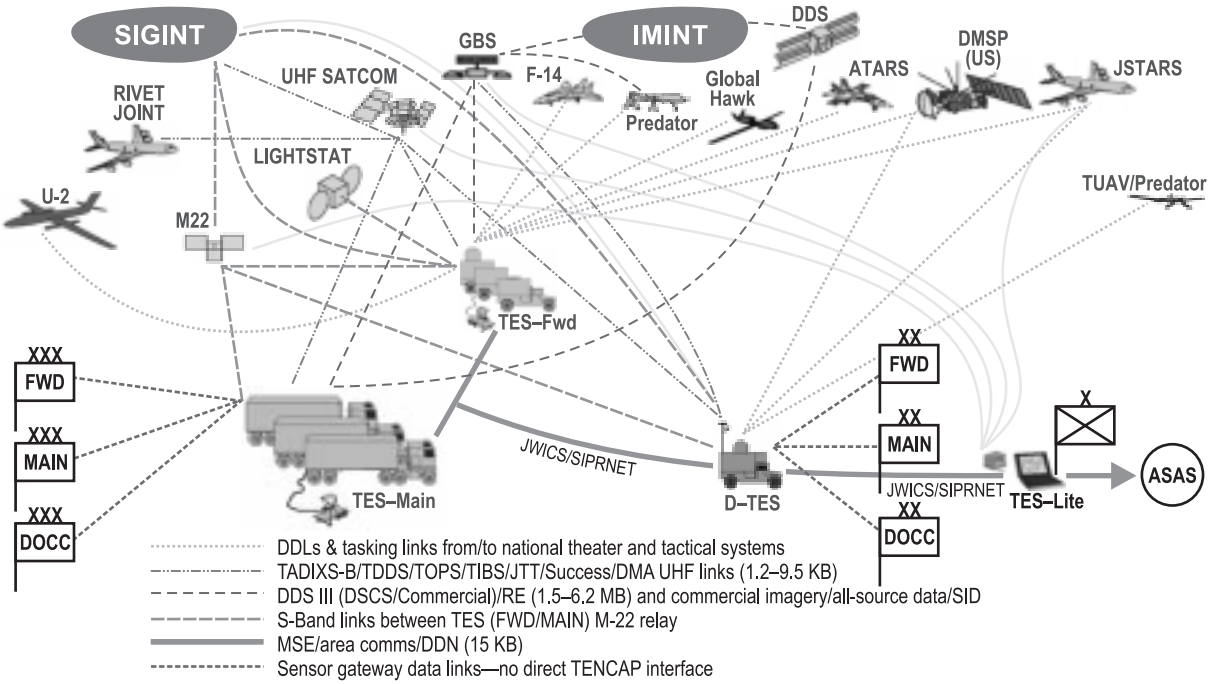


Figure 2. Tomorrow's Architecture

tion to the user's location in the required time. It also provides the commander with full operations support and enhanced command and control capabilities. While in travel configuration, the MITT can receive UHF broadcast and imagery. The MITT's ability to receive and process national- and theater-level data, coupled with its easy mobility and small size, make it an outstanding support system for early entry operations.

The forward area support terminal (FAST) is a transportable, modular, survivable, stand-alone TENCAP system designed specifically to support the separate brigades. The FAST receives, correlates, integrates, and disseminates multidisciplined information to the users' location in the required time. It provides MITT functionality in transit case configuration. The FAST links national and theater intelligence with early entry forces, small JTFs, and separate brigade-sized units.

TENCAP is supporting the interim brigade combat teams (IBCT). The IBCT at I Corps, Fort Lewis, Washington, has been enhanced with an MITT (E-MITT) system for early entry operations. The E-MITT adds to the intelligence and communications capabilities of the standard MITT with functions such as receiving, processing, and displaying weather information collected by Defense Meteorological Support Program and National Oceanic and Atmospheric Administration satellites. ASPO is continuing to monitor Transformation concepts and add equipment to respond to the commander's intelligence requirements.

## Future System—DCGS-A

The Army is responding to future intelligence requirements via distributed common ground station-army (DCGS-A) architecture. This architecture integrates existing and future ISR ground processors to produce a common network-centric, modular, scalable, multi-intelligence architecture that is interoperable with other service intelligence ground stations. The DCGS-A architecture will also accommodate future intelligence requirements using a block-implementation approach. This architecture will be filled at corps, division, brigade, and battalion levels and then scaled to fit the respective echelon. Achieving this goal will improve operator proficiency, advance technology enhancements, and reduce operations and maintenance costs. ***MR***

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